

Proposal Topic

BitCoin Exchange Trust Network Analysis

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I. INTRODUCTION

BitCoin was developed in 2008 and 2009 as a radical new concept for money and currency [1] using blockchain technology. Blockchain is a distributed database which keeps record in a distributed fashion. Figure 1 shows the schematic diagram of blockchain. A block encrypts the data using cryptographic hash function, such as SHA-256, and keeps record of next available block for traversing the blocks. Records are stored in a tree structure where the leaves stores the transaction information and other intermediate nodes store the hash values. The root of this tree belongs in a block containing the hash value generated from child nodes. The timestamp in a block is used to synchronize the position of a block in blockchain. A block also contains NONCE value, which is random unique number for a specific block.

Our research focuses on study data from a BITCOIN marketplace with interactions and ratings [3]. They are (directed) weighted signed network (WSN) in which edge corresponds to some weight, the rating from user u to user v [4]. They forms webs of trust between users allowing two unknown users to perform a transaction based on the aggregated trust [4].

II. METHODOLOGY

Our paper is to study the two trust networks: Bitcoin OTC web of trust network and Bitcoin Alpha web of trust network, and analyze the relationship between price and trust. Moreover, we will predict

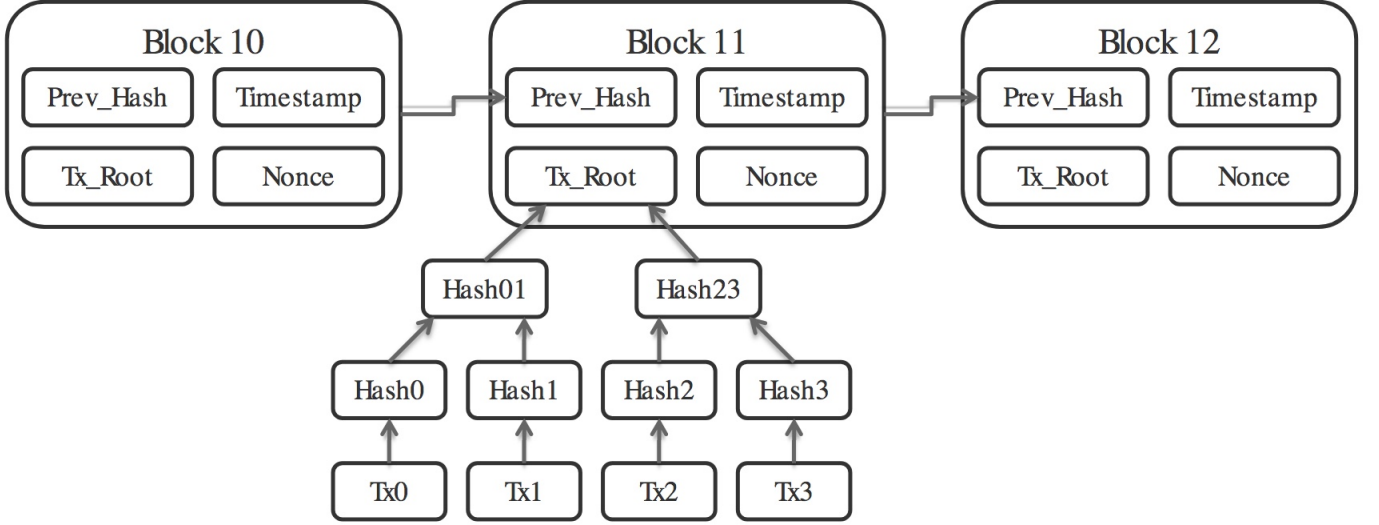


Fig. 1: Blocks are connected in a chained fashion where each block contains many transaction records. This figure regenerated from [2].

edge weights from time stamp data in the data sets. For the experiment, we will extract both topological and non-topological features from the networks [5] [6] [7].

III. DATA

We will use two data sets, soc-sign-bitcoin-otc and soc-sign-bitcoin-alpha, from [8]. OTC and Alpha are two Bitcoin exchanges, which are open market websites allowing users to buy and sell things [8]. The soc-sign-bitcoin-otc, Bitcoin OTC web of trust network, is a (directed) weighted signed network (WSN) with 5,881 nodes and 35,592 edges. On Bitcoin OTC, people can build up trust to exchange bitcoins with ratings from -10 (total distrust) to 10 (total trust) which are associated with how much a user trusts another user [4]. A high rating is mapping the high trust. The data set has the rating times recorded as seconds since Epoch [8].

And the soc-sign-bitcoin-alpha, Bitcoin Alpha web of trust network, is also a directed WSN with 3,783 nodes and 24,186 edges. It is similar in almost every way to the soc-sign-bitcoin-otc. It also has ratings from -10 to 10 and the rating times. While the OTC network is still active, the Alpha exchange is no longer active now [4].

IV. RELATED WORK

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V. TENTATIVE PLAN

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